APPENDIX D BEST MANAGEMENT PRACTICES

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BEST MANAGEMENT PRACTICES

The Jack Rabbit to Big Sky Meadow Village (JRBS) project incorporates Best Management Practices (BMPs) that would be employed as necessary and appropriate, through project construction and during operation and maintenance, to avoid or minimize environmental impacts and to protect the environment as standard practice for the entire project. BMPs have been incorporated into the project for general application as part of the project description. The BMPs described in this Appendix are measures that NorthWestern Energy (NorthWestern) is committed to implementing as part of project development and are an addition to the Project Design Features (PDFs) listed in Chapter 2 and the resource specific mitigation listed in Chapter 3.

BMPs Applicable to Tree Removal Activities

Assumes skid trails will not be used and that existing access roads or established overland routes will serve as the skid trail for any ground based tree removal activities.

Design Features – Access off Established Routes, Slope Limitations, and Felling Procedures for Timber Removal

- Mechanical ground-based skidding equipment may be used off of access roads or established overland travel routes only to the degree required to remove necessary woody material and only when soil moisture conditions are favorable (see below for details).

- Directional felling will be used to minimize the need for ground-based skidding equipment travel off existing travel routes.

- Use ground-based harvest or wood removal systems only on slopes having sustained grades less than 35 percent.

Restrictive Soil Moisture Conditions - it is assumed that the majority of timber removal by skidding can be completed from the established travel route. The following criteria apply, however, if ground-based skidding is needed off of established access routes.

- Ground based skidding equipment may travel off of the established access routes along the transmission line corridor, but only to the extent reasonable to remove the necessary woody materials based on the project administrator's judgment; and only when the top six inches of soil will not form a ball, when squeezed in the palm of the hand, that withstands a moderate amount of handling. *Criteria integrates the combined influence of soil texture and soil moisture – see USDA Technical Guide for Estimating Soil Moisture (USDA-NRCS 1998).*

- In some limited instances, soils and vegetation may be too dry to allow ground-based, mechanical skidding or harvesting equipment to operate off of established access routes. Ground-based, mechanical skidding equipment will not be allowed off established access routes under extremely dry conditions. If high fire hazard conditions exist, all travel along overland access routes may also be temporarily suspended

BMPs Applicable to Temporary Access Roads and Overland Travel Routes, Including Those Used to Remove Wood Products

Design Features – Layout of temporary roads and trails and use of erosion control and drainage BMPs

- Lay out any temporary access roads or overland travel routes in a manner that minimizes sustained grades steeper than 15 percent to the extent possible.
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- Avoid locating temporary access roads or overland travel routes over convex knobs or along narrow, rocky ridges (areas least able to recover from disturbance) to the extent possible.
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- All temporary access roads and those overland travel routes used as skid trails will be constructed with water erosion control and drainage measures installed comparable to what is required by standard timber sale provisions.

Winter Harvesting Restrictions

- Site access off of establish access routes during the winter for both wood removal and access purposes will be limited to periods when there is a minimum of eight inches of settled snow depth covering the ground surface or when the top four inches of mineral soil is frozen, unless the GNF soil surface stoniness or soil moisture/texture criteria are met. Travel off existing access roads, for any purpose, must not be conducted when ponding occurs at the soil surface due to partial thawing of a surface frost layer.

BMPs Applicable to Construction and Decommissioning of Temporary Roads as well as Upgrades to Existing Temporary Roads

It is assumed that the amount of temporary road construction will be minimal.

- Where topsoil will be displaced by blading or excavation, comply with topsoil salvage, storage, and replacement requirements listed in "BMPs Applicable to All Soil Excavations of Limited Aerial Extent – Includes Excavations for the Installation of Transmission Poles."

- Minimize the depth of blading during construction of temporary access roads to the extent feasible within the constraints of US Forest Service (USFS) standards for temporary road construction. Temporary access roads should be built to a standard that provides for the safe and efficient transport of personnel, equipment, and materials while removing as little surface soil material as possible.

- The road prism during decommissioning will be ripped to a depth of six to eight inches along the entire road length for all temporary roads that will not be retained as part of the permanent service road infrastructure. This requirement may be waived on sections of road with extremely high amounts of rock fragments, defined as greater than 40 percent, three inch or larger rock fragments or more than 60 percent rock fragments overall in the top six to eight inches. Cut and fill slopes along sections of temporary access roads will be re-contoured based on management objectives and the suitability of site conditions. Weed control and the establishment of suitable, native-based vegetation will be completed along all decommissioned temporary roads. Some modified versions of partial re-contouring or partial ripping may be considered if warranted by special circumstances.

- Add slash to decommissioned temporary access roads at an approximate rate of 5-10 tons per acre (coarse and fine woody debris) at the completion of logging in wooded areas. Slash left should be oriented primarily at right angles to the road bed.

BMPs Applicable to Areas of Detrimental Soil Compaction or Rutting, including Overland Routes, Stockpile or Staging Areas or Other Comparable Areas

Soil Mitigations – Site Prep and Seeding

- Areas of detrimental compaction or rutting, as defined in Keck 2012, will be ripped to a depth of six to eight inches along overland travel corridors, staging or decking areas, timber removal areas, and conductor splicing, pulling, and tensioning areas. This requirement may be waived on sites having abundant large rock fragments defined as greater than 40 percent three inch or larger rock fragments or more than 60 percent rock fragments overall in the top six to eight inches of soil. *Note: Detrimental soil compaction is most often associated with substantial, observable impacts to existing understory or grassland vegetation*

- Suitable, native-based vegetation will be re-established in all ripped areas in accordance to guidelines provided by soil management unit as described in Appendix C (Weed Management, Reclamation, and Revegetation Plan).

BMPs Applicable to All Soil Excavations of Limited Aerial Extent – Includes Excavations for the Installation of Transmission Poles

- Topsoil will be salvaged separately, subject to allowable exceptions, in a single one foot topsoil lift for all excavations of limited extent. Salvaged topsoil will be replaced as surface soil layers during backfilling with excess subsoil, substrate, and/or large rock materials disposed of onsite in a dispersed manner or removed from the site*.

    - Exceptions: Salvage depth may be reduced to 0.5 foot if there is a significant change in soil properties within the top foot soil so that soil in the six to 12 inch depth is decidedly less suitable as a plant growth medium than the top six inches *(this would most often be due to a substantial increase in the amount of rock fragments).*

    - Topsoil salvaging is waived on sites where there are enough rocks at the surface or in surface soil layers so as to make topsoil salvaging unreasonable or of limited benefit. Topsoil salvaging will not be required for following surface stoniness classes: rubbly, extremely bouldery, very bouldery, or extremely stony, as well for surface soil layers with more than 60% total rock fragments by volume.

** See current Gallatin National Forest BMPs (Keck 2012) for additional notes on use of tarps for hand dug excavations, possible application of forest litter or woof chips in forested areas, and scattering or removal excess subsoil, substrate, or rock material from excavation sites.*

General Best Management Practices:

1. Wetland matting will be used if wetlands need to be crossed while accessing transmission structure locations.

2. Wetlands will be avoided in the selection of structure installation sites. If a structure must be installed within a wetland, direct embedding is preferred if possible.

3. Clear the minimum amount of trees as necessary in palustrine forested wetlands.

4. Roads will be built at right angles to the streams, to the extent practicable (However no roads building [expectable for a temporary access road at Indian Ridge Staging Area] are anticipated). Existing public roads will be utilized to the extent possible. Culverts will be installed where needed to avoid sediment discharge. All existing roads will be left in a condition equal to, or better than, their condition prior to the construction of the transmission line.

5. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to drainage channels and streambanks (e.g., structures). Montana 310 permits will be acquired from the Gallatin Conservation District for stream crossings, culverts, or channel modifications.

6. Establish and maintain construction area limits to the minimum area necessary for completion of the project and confine disturbance to within this area.

7. Erosion and sediment control measures would be designed to minimize erosion and sediment discharge. This will include revegetating all disturbed areas and use of erosion blankets on any disturbed areas within 10 feet of stream channels. All State of Montana DEQ water quality standards for beneficial uses will be met and all required permits such as 310 streambed protection and CWA 402 stormwater discharge compliance provisions will be met http://www.deq.mt.gov/wqinfo/MPDES/StormwaterIndustrial.mcpx.

8. To the extent possible, erosion control devices would be installed prior to working in the affected area.

9. In construction areas, work would be halted where wet conditions cause excessive rutting of roads and/or work areas. Work would not resume until conditions improve and the damaged road segments are repaired.

10. Excavated areas would be backfilled to final surface grade and condition as soon as possible.

11. Apply soil protective cover/ erosion blankets or erosion control devices on disturbed areas where natural revegetation is inadequate to prevent accelerated erosion before the next growing season.

12. Maintain the natural drainage pattern of the area wherever practicable. Control, collect, detain, treat and/or disperse stormwater runoff from the site.

13. Divert surface runoff around bare areas with appropriate energy dissipation and sediment filters.

14. Limit operation of equipment when ground conditions could result in excessive rutting, soil puddling or runoff of sediments directly into waterbodies.

15. Install suitable stormwater and erosion control measures to stabilize disturbed areas and waterways where project work is incomplete prior to seasonal shutdown of operations or

when severe storms or cumulative precipitation events that could result in sediment movement to streams are expected.

16. Maintain erosion and stormwater controls as necessary to ensure proper and effective functioning. Prepare for unexpected failures of erosion control measures.

17. Routinely inspect construction sites to verify that erosion and stormwater controls are implemented and functioning as designed and are appropriately maintained.

18. Confine construction of temporary roads to the planned roadway limits unless otherwise specified.

19. Avoid deposition of material outside the designated roadway limits.

20. Use suitable crossing structures, or temporarily dewater live streams, where temporary roads cross streams.

21. Reconstruct existing roads only to the degree necessary to provide adequate drainage and safety and provide minimum access to the infrastructure.

22. Disturbed sites will be treated for weeds, revegetated and monitored according to specifications described in Appendix C – Weed Management, Reclamation, and Revegetation Plan.

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